

WHAT IS CLAIMED IS:

1. A fiber to the home (FTTH)system for convergence of digital broadcast and communication signals through a switched broadcast, comprising:

5 an optical line terminal (OLT) for receiving a first predetermined number of broadcast signals and an Ethernet signal, converting the received broadcast signals and Ethernet signal into a plurality of converted optical signals, combining the converted optical signals into converged optical signals, and transmitting the converged optical signals by an optical wavelength division multiplexing method;

10 an optical network unit (ONU) for receiving and classifying the converged optical signals transmitted from the OLT back into the first predetermined number of broadcast signals and the Ethernet signal, converting the classified signals into electrical signals, and said ONU switching a second predetermined number of broadcast signals from the first predetermined number of broadcast signals according to each subscriber interface unit
15 (SIU) by a channel selection information contained in upstream Ethernet information, switching the Ethernet signal to be transmitted according to each SIU and transmitting the switched second predetermined number of the switched broadcast signals and the switched Ethernet signals in optical; and

 an SIU for converting the second predetermined number of broadcast signals
20 transmitted from the ONU into electrical signals, transmitting the second predetermined number of broadcast signals and the Ethernet signal to be transmitted to a subscriber to a corresponding subscriber' terminal, and transmitting the upstream Ethernet information

including the upstream Ethernet information for the broadcasting signal to the ONU.

2. The FTTH system as claimed in claim 1, wherein the ONU comprises:

a multiple program transport stream (MPTS) switch for switching the second
5 predetermined number of broadcast signals of the first predetermined number of
broadcasting signals according to each SIU by the channel selection information contained
in the upstream Ethernet information transmitted from the SIUs;

a plurality of time division multiplexers for time division multiplexing the second
predetermined number of SIU-based broadcast signals so as to transmit the multiplexed
10 signal to a corresponding SIU;

a first Ethernet switch for switching the Ethernet signal from the OLT from the
switched signals to the SIU, and for transmitting the channel selection information
contained in upstream Ethernet information from the SIU to the MPTS switch; and

a first transceiver for transmitting the time division multiplexed broadcast signal
15 and the Ethernet signal from the OLT switched by the first Ethernet switch to each SIU,
and receiving the upstream Ethernet information from the SIUs to transmit the received
information to the first Ethernet switch.

3. The FTTH system as claimed in claim 2, wherein the SIU comprises:

20 a second transceiver for receiving the time division multiplexed broadcast signal
and the Ethernet signal transmitted to the OLT from the ONU, and transmitting the
upstream Ethernet information having the channel selection information generated by the

subscriber;

a time division demultiplexer for time division demultiplexing the time division multiplexed broadcasting signal from the ONU so as to classify the broadcast signal into respective broadcasting signals, and transmitting the classified signals to a set top box

5 (STB) of a subscriber in an exterior; and

a second Ethernet switch for receiving channel selection information from the STB of the subscriber and an Ethernet signal from an exterior internet/PC so as to the received information and signal to the transceiver, transmitting the Ethernet signal from the OLT transmitted through the transceiver to an exterior apparatus.

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4. The FTTH system as claimed in claim 2, wherein the first transceiver is a triplex transceiver comprising:

a first optical transmitter for converting each of the time division multiplexed broadcasting signals into an optical signal to provide a plurality of converted optical
15 signals that are transmitted;

a second optical transmitter for converting the Ethernet signal from the OLT into an optical signal so as to transmit the converted signal along with the plurality of converted optical signals as converged optical signals; and

a first optical receiver for receiving the upstream Ethernet information from at least
20 one SIU so as to transmit the received information to the first Ethernet switch.

5. The FTTH system as claimed in claim 3, wherein the second transceiver comprises a triplex transceiver including:

a second optical receiver for converting the time division multiplexed broadcast signal from the ONU into an electrical signal so as to transmit the converted signal to the time division demultiplexer;

a third optical receiver for converting the Ethernet signal from the OLT into an electrical signal so as to transmit the converted signal to the second Ethernet switch; and

a third optical transmitter for receiving the upstream Ethernet information from the second Ethernet switch so as to transmit the received information to the ONU.

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6. The FTTH system as claimed in claim 1, wherein the ONU comprises:

an MPTS switch for switching the second predetermined number of broadcasting signals of the first predetermined number of broadcasting signals according to each SIU by channel selection information contained in the upstream Ethernet information transmitted from the SIUs;

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a first Ethernet switch for switching the Ethernet signal from the OLT so as to transmit the switched signal to the SIU, and transmitting the channel selection information contained in the upstream Ethernet information from the SIU to the MPTS switch;

a plurality of time division multiplexers for time division multiplexing the second predetermined number of SIU-based broadcasting signals switched by the MPTS switch and the Ethernet signal from the OLT transmitted through the first Ethernet switch to transmit the broadcast signals and the Ethernet signal to a corresponding subscriber; and

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a first transceiver for transmitting the time division multiplexed broadcasting signal and the Ethernet signal to each SIU, and receiving the upstream Ethernet information from the SIUs to transmit the received information to the first Ethernet switch.

5 7. The FTTH system as claimed in claim 6, wherein the SIU comprises:

a second transceiver for receiving the time division multiplexed broadcasting signal and the Ethernet signal from the ONU, and transmitting the upstream Ethernet information having the channel selection information generated by the subscriber;

10 a time division demultiplexer for time division demultiplexing the time division multiplexed broadcasting signal and the Ethernet signal from the ONU s to classify the signals into respective broadcastings signal and Ethernet signals, and transmitting the classified broadcasting signal to an STB of a subscriber in an exterior; and

15 a second Ethernet switch for receiving channel selection information from the STB of the subscriber and an upstream Ethernet signal from an exterior internet/PC so as to the received information and signal to the second transceiver, transmitting the Ethernet signal transmitted through the time division demultiplexer to an exterior apparatus.

8. The FTTH system as claimed in claim 6, wherein the first transceiver comprises a diplex transceiver including:

20 a first optical transmitter for converting the time division multiplexed broadcast signal and the Ethernet signal from the OLT into a plurality of converted optical signals so as to transmit the converted signals; and

a first optical receiver for receiving the upstream Ethernet information from the SIUs so as to transmit the received information to the first Ethernet switch.

9. The FTTH system as claimed in claim 7, wherein the second transceiver includes

5 a diplex transceiver comprising:

a second optical transmitter for converting the time division multiplexed broadcasting signal and the Ethernet signal from the ONU into an electrical signal so as to transmit the converted signal to the time division demultiplexer; and

a second optical receiver for receiving the upstream Ethernet information from the
10 second Ethernet switch so as to transmit the received information to the ONU.

10. A method providing convergence of digital broadcast and communication signals through a switched broadcast in a fiber to the home (FTTH) system, said method comprising the steps of:

15 (a) receiving a first predetermined number of broadcast signals and an Ethernet signal by an optical line terminal (OLT) for, converting the received broadcast signals and Ethernet signal into a plurality of converted optical signals, combining the converted optical signals into converged optical signals, and transmitting the converged optical signals by an optical wavelength division multiplexing method;

20 (b) receiving and classifying the converged optical signals transmitted from the OLT by an optical network unit (ONU) for the first predetermined number of broadcast signals and the Ethernet signal by converting the classified signals into electrical signals,

and said ONU switching a second predetermined number of broadcast signals from the first predetermined number of broadcast signals according to each subscriber interface unit (SIU) by a channel selection information contained in upstream Ethernet information, and switching the Ethernet signal to be transmitted according to each SIU so as to transmit the
 5 switched signals; and

(c) converting the second predetermined number of broadcast signals transmitted from the ONU into electrical signals by the SIU, transmitting the second predetermined number of broadcast signals and the Ethernet signal to be transmitted to a subscriber to a corresponding subscriber's terminal, and transmitting the upstream Ethernet information
 10 including the upstream Ethernet information for the broadcasting signal to the ONU.

11. The method according to claim 10, wherein the ONU comprises:

a multiple program transport stream (MPTS) switch for switching the second predetermined number of broadcast signals of the first predetermined number of
 15 broadcasting signals according to each SIU by the channel selection information contained in the upstream Ethernet information transmitted from the SIUs;

a plurality of time division multiplexers for time division multiplexing the second predetermined number of SIU-based broadcast signals so as to transmit the multiplexed signal to a corresponding SIU;

20 a first Ethernet switch for switching the Ethernet signal from the OLT from the switched signals to the SIU, and for transmitting the channel selection information contained in upstream Ethernet information from the SIU to the MPTS switch; and

a first transceiver for transmitting the time division multiplexed broadcast signal and the Ethernet signal from the OLT switched by the first Ethernet switch to each SIU, and receiving the upstream Ethernet information from the SIUs to transmit the received information to the first Ethernet switch.

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12. The method according to claim 10, wherein the SIU comprises:

a second transceiver for receiving the time division multiplexed broadcast signal and the Ethernet signal transmitted to the OLT from the ONU, and transmitting the upstream Ethernet information having the channel selection information generated by the subscriber;

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a time division demultiplexer for time division demultiplexing the time division multiplexed broadcasting signal from the ONU so as to classify the broadcast signal into respective broadcasting signals, and transmitting the classified signals to a set top box (STB) of a subscriber in an exterior; and

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a second Ethernet switch for receiving channel selection information from the STB of the subscriber and an Ethernet signal from an exterior internet/PC so as to the received information and signal to the transceiver, transmitting the Ethernet signal from the OLT transmitted through the transceiver to an exterior apparatus.

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13. The method according to 10, wherein the first transceiver comprises a triplex transceiver including:

a first optical transmitter for converting each of the time division multiplexed broadcasting signals into an optical signal to provide a plurality of converted optical signals that are transmitted;

a second optical transmitter for converting the Ethernet signal from the OLT into an optical signal so as to transmit the converted signal along with the plurality of converted optical signals as converged optical signals; and

a first optical receiver for receiving the upstream Ethernet information from at least one SIU so as to transmit the received information to the first Ethernet switch.

14. The method according to claim 12, wherein the second transceiver comprises a triplex receiver including:

a second optical receiver for converting the time division multiplexed broadcast signal from the ONU into an electrical signal so as to transmit the converted signal to the time division demultiplexer;

a third optical receiver for converting the Ethernet signal from the OLT into an electrical signal so as to transmit the converted signal to the second Ethernet switch; and

a third optical transmitter for receiving the upstream Ethernet information from the second Ethernet switch so as to transmit the received information to the ONU.

15. The method according to claim 10, wherein the ONU comprises:

an MPTS switch for switching the second predetermined number of broadcasting signals of the first predetermined number of broadcasting signals according to each SIU by channel selection information contained in the upstream Ethernet information transmitted
5 from the SIUs;

a first Ethernet switch for switching the Ethernet signal from the OLT so as to transmit the switched signal to the SIU, and transmitting the channel selection information contained in the upstream Ethernet information from the SIU to the MPTS switch;

a plurality of time division multiplexers for time division multiplexing the second
10 predetermined number of SIU-based broadcasting signals switched by the MPTS switch and the Ethernet signal from the OLT transmitted through the first Ethernet switch to transmit the broadcast signals and the Ethernet signal to a corresponding subscriber; and

a first transceiver for transmitting the time division multiplexed broadcasting signal and the Ethernet signal to each SIU, and receiving the upstream Ethernet information from
15 the SIUs to transmit the received information to the first Ethernet switch.

16. The method according to claimed in claim 15, wherein the SIU comprises:

a second transceiver for receiving the time division multiplexed broadcasting signal and the Ethernet signal from the ONU, and transmitting the upstream Ethernet information
20 having the channel selection information generated by the subscriber;

a time division demultiplexer for time division demultiplexing the time division multiplexed broadcasting signal and the Ethernet signal from the ONU s to classify the

signals into respective broadcastings signal and Ethernet signals, and transmitting the classified broadcasting signal to an STB of a subscriber in an exterior; and

a second Ethernet switch for receiving channel selection information from the STB of the subscriber and an upstream Ethernet signal from an exterior internet/PC so as to the received information and signal to the second transceiver, transmitting the Ethernet signal transmitted through the time division demultiplexer to an exterior apparatus.

17. The method according to claim 15, wherein the first transceiver comprises a diplex transceiver including:

a first optical transmitter for converting the time division multiplexed broadcast signal and the Ethernet signal from the OLT into a plurality of converted optical signals so as to transmit the converted signals; and

a first optical receiver for receiving the upstream Ethernet information from the SIUs so as to transmit the received information to the first Ethernet switch.

18. The method according to claim 16, wherein the second transceiver includes a diplex transceiver comprising:

a second optical transmitter for converting the time division multiplexed broadcasting signal and the Ethernet signal from the ONU into an electrical signal so as to transmit the converted signal to the time division demultiplexer; and

a second optical receiver for receiving the upstream Ethernet information from the second Ethernet switch so as to transmit the received information to the ONU.